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Information technology — Data communication — 25-pole DTE/DCE interface connector and contact number assignments

[Revision of third edition (ISO 2110:1989)]

Technologies de l'information — Communication de données — Connecteur d'interface ETDD/ETCD à 25 pôles et affectation des numéros de contacts

ICS

Descriptors:

In accordance with the provisions of Council Resolution 21/1986 this DIS is submitted in the English language only.

Conformément aux dispositions de la Résolution du Conseil 21/1986, ce DIS est distribué en version anglaise seulement.

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Revised Committee Draft on

INTERNATIONAL STANDARD ISO/IEC 2110

Data communication -- 25-pole DTE/DCE interface connector and contact number assignments

0 Introduction

In this revision the Amendment 1:1991 was incorporated. Table 1 was restructured. Outdated techniques like V.19, V.25 and S.16 were removed. Other columns were merged in order to provide information in a more concise fashion.

1 Scope

This International Standard specifies a 25-pole connector, including the necessary mateability dimensions and the assignment of contact numbers, for use at the interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE). It is applicable where the functional characteristics of the interface conform to ITU-T Recommendations V.24 or X.24, and the electrical characteristics conform to ITU-T Recommendations V.10, V.11, and V.28 or (for Recommendation V.20 type outstation interface) V.31 or V.31 bis.

This International Standard additionally provides the dimensions of the connector housing as well as the recommended means of providing a locking device (latching block) and connector shielding.

2 Normative References

The following International Standards and ITU-T Recommendations contain certain provisions that, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All International Standards and ITU-T Recommendations are subject to revision, and parties to agreement based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the Standards/Recommendations indicated below. Members of

international standards bodies maintain registers of currently valid International Standards and ITU-T Recommendations.

ISO 261, ISO general purpose metric screw threads -- General plan.

ITU-T Recommendation V.10:1988, Electrical Characteristics for unbalanced double current interchange circuits for general use with integrated circuit equipment in the field of data communications.

ITU-T Recommendation V.11:1988, Electrical characteristics for balanced double current interchange circuits for general use with integrated circuit equipment in the field of data communications.

ITU-T Recommendation V.20, Parallel data transmission modems standardized for universal use in the general switched telephone network.

ITU-T Recommendation V.21, 300 bits per second duplex modem standardized for use in the general switched telephone network.

ITU-T Recommendation V.22, 1 200 bits per second duplex modem standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits.

ITU-T Recommendation V.22 bis, 2 400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits.

ITU-T Recommendation V.23, 600/1 200-baud modem standardized for use in the general switched telephone network.

ITU-T Recommendation V.24, List of definitions for interchange circuits between data terminal equipment and data circuit-terminating equipment.

ITU-T Recommendation V.26, 2 400 bits per second modem standardized for use on 4-wire leased telephone-type circuits.

ITU-T Recommendation V.26 bis, 2 400/1 200 bits per second modem standardized for use in the general switched telephone network.

ITU-T Recommendation V.26 ter, 2 400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits.

ITU-T Recommendation V.27, 4 800 bits per second modem with manual equalizer standardized for use on leased telephone-type circuits.

ITU-T Recommendation V.27 bis, 4 800/2400 bits per second modem with automatic equalizer standardized for use on leased telephone-type circuits.

ITU-T Recommendation V.27 ter, 4 800/2 400 bits per second modem standardized for use in the general switched telephone network.

ITU-T Recommendation V.28, Electrical characteristics for unbalanced double-current interchange circuits.

ITU-T Recommendation V.29, 9 600 bits per second modem standardized for use on point-to-point 4-wire leased telephone-type circuits.

ITU-T Recommendation V.31, Electrical characteristics for single-current interchange circuits controlled by contact closure.

ITU-T Recommendation V.31 bis, Electrical characteristics for single-current interchange circuits using optocouplers.

ITU-T Recommendation V.32, A family of two-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits.

ITU-T Recommendation V.32 bis, A duplex modem operating at data signalling rates up to 14 400 bits/s for use on the general switched telephone network and on leased telephone-type circuits.

ITU-T Recommendation V.33, 14 400 bits per second modem standardized for use on point-to-point 4-wire leased telephone-type circuits

ITU-T Recommendation V.34, A modem operating at data signalling rates of up to 33 600 bit/s for use on the General Switched Telephone Network and on leased point-to-point 2-wire telephone-type networks.

ITU-T Recommendation X.20, Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for start-stop transmission services on public data networks.

ITU-T Recommendation X.20 bis, Use of public data networks on data terminal equipment (DTE) which is designed for interfacing too asynchronous duplex V-series modems.

ITU-T Recommendation X.21 bis, Use on public data networks of data terminal equipment (DTE) which is designed for interfacing to synchronous V-series modems.

ITU-T Recommendation, X.24, List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) on public data networks.

IEC Publication 807-2, Rectangular connectors for frequencies below 3 MHz - Part 2: Detail specification for a range of connectors with round contacts.

IE Publication 50(581), International Electrotechnical Vocabulary, Chapter 581, Electromechanical components for electronic equipment.

3 Definitions

The following definitions have been taken from IEC Publication 50(581)-1978.

3.1 cable adaptor: A part of a connector or any accessory consisting of a rigid housing for attachment to the connector body. It may incorporate provision for a cable clamp or seal for terminating screens and provide shielding to electrical interference. It may be straight or angled.

3.2 connector housing: A part of a connector into which the insert and contacts are assembled.

3.3 contact arrangement: The number, spacing and configuration of contacts in a component.

3.4 female contact: A contact intended to make electrical engagement on its inner surface and which will accept entry of a male contact.

3.5 intermateable connectors: Two connectors are intermateable when they are capable of being connected electrically and mechanically but without regard to their performance and intermountability.

3.6 locking device: A feature incorporating certain components to provide mechanical retention of their mating parts.

3.7 male contact: A contact intended to make electrical engagement on its outer surface and which will enter a female contact.

3.8 (n-pole-)connector: A component which terminates conductors for the purpose of providing connection and disconnection to a suitable mating component.

4 Connector

A 25-pole connector shall be provided for the DTE/DCE interface.

Figures 1 to 6 illustrate the 25-pole connector. Only those dimensions that are essential for mating are shown.

Figure 1 illustrates the DTE connector which has 25 male contacts in a connector housing. Figure 2 illustrates the DCE connector which has 25 female contacts in a connector housing. The connector housing on the DCE connector is dimensioned to fit inside the connector housing of the DTE connector (see figures 1 and 2). Contact numbering is specified in figures 1 and 2. Figure 3 illustrates the dimensions for the contact spacing. Figures 4 and 5 illustrate the dimensions for the male and female contacts respectively.

The DCE connector may be equipped with a locking device consisting of two latching blocks as specified in figure 6. Due to the fact that the latching blocks have threaded holes which can act as nuts, the DTE connector may be equipped either with lever devices for latching to the latching blocks on the DCE connector or with screws that fit into the threaded holes in the latching blocks.

Latching blocks shall use either the 4-40 UNC thread or, if required by national regulations or mutual user agreement, M 3 as specified in figure 6.

When procuring equipment internationally which will use this 25-pole connector, the user shall specify the thread type in accordance with national requirements.

Sufficient connector dimensions are provided in this International Standard to ensure intermateable connectors. They are consistent with the detailed connector specification in the IEC Publication 807-2.

In annex A diagrams for finger clearance areas are given to provide guidance for equipment designers. Figure A.1 shows the maximum DTE connector outline including all means for latching to the latching blocks. Figure A.2 shows the minimum DCE connector spacing when multiple interface arrangements are used.

5 Assignment of contact numbers

The assignments of contact numbers are given in table 1.

The list of the interchange circuits is given in table 2. Their provision and use shall be in conformity with the ITU-T Recommendations, referred to in the heading of table 1.

6 Connector shielding

Connector shielding is optional. If it is used, for example due to national regulations, etc., it shall be accomplished by the use of metallic connector housings on both the DTE connector and the DCE connector.

Bibliography

ISO 4902, Data communication -- 37-pole DTE/DCE interface connector and contact number assignments.

ISO 4903, Data communication -- 15-pole DTE/DCE interface connector and contact number assignments.

ITU-T Recommendation V.25 -- Automatic answering equipment and general procedures for automatic calling equipment on the General Switched Telephone Network including procedures for disabling of echo control devices for both manually and automatically established calls.

ITU-T Recommendation V.25 bis, Synchronous and asynchronous automatic dialling procedures on switched networks.

ITU-T Recommendation V.25 ter, Serial automatic dialling and control

Table 1 -Assignment of contact numbers

Electrical Characteristic	V.10 or V.28 ⁸⁾	V.10/V.11	V.28	V.31	V.28	V.31bis	V.28	V.28
Contact	V.series ⁸⁾	V.series	V.20A instat ion	V.20A outstat ion	V.20B instat ion	V.20B outstat ion	X.20bis	X.21bis
1 ¹⁾	shield	shield	shield	shield	shield	shield	shield	shield
2	103	103A	9)	192-A	9)	119-A	103	103
3	104	104A	A1 ¹⁰⁾	A1 ¹¹⁾	A1 ¹⁰⁾	A1 ¹¹⁾	104	104
4 ²⁾	105/133	105A/133A	A2 ¹⁰⁾	A2 ¹¹⁾	A2 ¹⁰⁾	A2 ¹¹⁾	F	105
5	106	106A	A3 ¹⁰⁾	A3 ¹¹⁾	A3 ¹⁰⁾	A3 ¹¹⁾	106	106
6	107	107	A4 ¹⁰⁾	B1 ¹¹⁾	A4 ¹⁰⁾	B1 ¹¹⁾	107	107
7	102 ¹³⁾	102 ¹³⁾	131	B2 ¹¹⁾	131	B2 ¹¹⁾	102	102
8	109	109A	109	B3 ¹¹⁾	109	B3 ¹¹⁾	109	109
9	F	115B	C1 ¹⁰⁾	C1 ¹¹⁾	C1 ¹⁰⁾	C1 ¹¹⁾	F	F
10	F	109	C2 ¹⁰⁾	C2 ¹¹⁾	C2 ¹⁰⁾	C2 ¹¹⁾	C2	F
11 ³⁾	126	113B	C3 ¹⁰⁾	C3 ¹¹⁾	C3 ¹⁰⁾	C3 ¹¹⁾	F	F
12 ⁴⁾	112/122 ¹²⁾	114B	C4 ¹⁰⁾	192-B	C4 ¹⁰⁾	119-B	F	F
13 ⁵⁾	121 ¹²⁾	106B	B1 ¹⁰⁾	11)	B1 ¹⁰⁾	11)	F	F
14 ⁵⁾	118 ¹²⁾	103B	B2 ¹⁰⁾	125-A	B2 ¹⁰⁾	125-A	F	F
15	114	114A	B3 ¹⁰⁾	125-B	B3 ¹⁰⁾	125-B	F	114
16 ⁵⁾	119 ¹²⁾	104B	B4 ¹⁰⁾	105-A	B4 ¹⁰⁾	105-A	F	F
17	115	115A	191-A	105-B	118	105-B	F	115
18	141	141	191-B	129-A	121	129-A	141	141
19 ⁵⁾	120	105B/133B	130	129-B	120	129-B	F	F
20 ⁶⁾	108	108	105	119-A	105	122-A	108	108
21	140	140	125	119-A	125	122-B	140	140
22 ⁷⁾	125/135	125	108	107-A	108	107-A	125	125
23	111	102 ¹³⁾	107	107-B	107	107-B	F	F
24	113	113A	102	108-A	102	108-A	F	F
25	142	142	124	108-B	124	108-B	142	142

F= contact reserved for International use

NOTES:

- 1) Contact 1 is provided for shield continuity. Any connection to protective or signal ground is governed by National Safety regulations. The particular grounding requirements or arrange-

ments may influence equipment susceptibility to main leakage noise.

- 2) The use of circuit 133 is only specified in Recommendation V.42 which is presently specified for duplex operation only. As circuit 105 is used for half duplex operation there should be no conflicts.
- 3) Circuit 126 is only specified in Recommendation V.21.
- 4) The use of circuit 122 is only specified in Recommendations V.23 (leased line), V.26, V.26bis, V.27, V.27bis, and V.27ter. The use of circuit 112 is specified in Recommendations V.22bis, V.32, V.33, and V.32bis.
- 5) The use of circuits 118, 119, 120 and 121 is only specified for modems with a backward channel, Recommendations V.23, V.26, V.26bis, V.27, V.27 bis and V.27ter.
- 6) Contact 20 may be designated either circuit 108/1 or 108/2.
- 7) Where ISO 8480 is implemented and backward channels are not present (see note 5), contact 14 is used for circuit 116/1 or 116/2 and contact 16 is used for circuit 117.
- 8) When used in connection with text telephone operation, contact 22 may be assigned to either circuit 125 or circuit 135 at different times during the call.
- 9) Contact 2 is reserved for national use. Where circuit 110 is provided in the DCE, it will use contact 2.
- 10) Received data circuits are designated A1 to A4, B1 to B4, and C1 to C3 corresponding to their relevant frequency.
- 11) Transmitted data circuits are designated A1 to A3, B1 to B3, and C1 to C3 corresponding to their relevant frequency, and all use contact 13 as their common return.
- 12) When asymmetrical duplex operation is used the following straps are permitted:

- | | |
|----------------------|------------------------|
| - in station A DCEs: | circuit 119 to contact |
| | 3 |
| | circuit 122 to contact |
| | 8 |
| -in station B DCEs | circuit 118 to contact |
| | 2 |
| | circuit 121 to contact |
| | 5 |

Where stations A have only the transmitter of the data channel and the receiver of the backward channel, and station B have only the receiver of the data channel and the transmitter of the backward channel.

- 13) Where electrical characteristics according to ITU-T Recommendation V.10 are used, this circuit provides the common return for both the DTE and DCE. It should be noted that only category 2 receivers, as specified in V.10, can be used on this interface.

Table 2 -- List of interchange circuits

Circuit number	Description
102	Signal ground or common return
103	Transmitted data
104	Received data
105	Request to send
106	Ready for sending
107	Data set ready
108/1	Connect data set to line
108/2	Data terminal ready
109	Data channel received line signal detector
110	Data signal quality detector
111	Data signalling rate selector (DTE source)
112	Data signalling rate selector (DCE source)
113	Transmitter signal element timing (DTE source)
114	Transmitter signal element timing (DCE source)
115	Receiver signal element timing (DCE source)
116/1	Back-up switching in direct mode
116/2	Back-up switching in authorized mode
117	Standby indicator
118	Transmitted backward channel data
119	Received backward channel data
120	Transmit backward channel line signal
121	Backward channel ready
122	Backward channel received line signal detector
124	Select frequency groups
125	Calling indicator
126	Select transmit frequency
129	Request to receive
130	Transmit backward tone
131	Received character timing
132	Return to non-data mode
133	Ready for receiving
135	Received enrgy present
140	Loopback/Maintenance test
141	Local loopback
142	Test indicator
191	Transmitted voice answer
192	Received voice answer
G	Signal ground or common return
T	Transmit
R	Receive

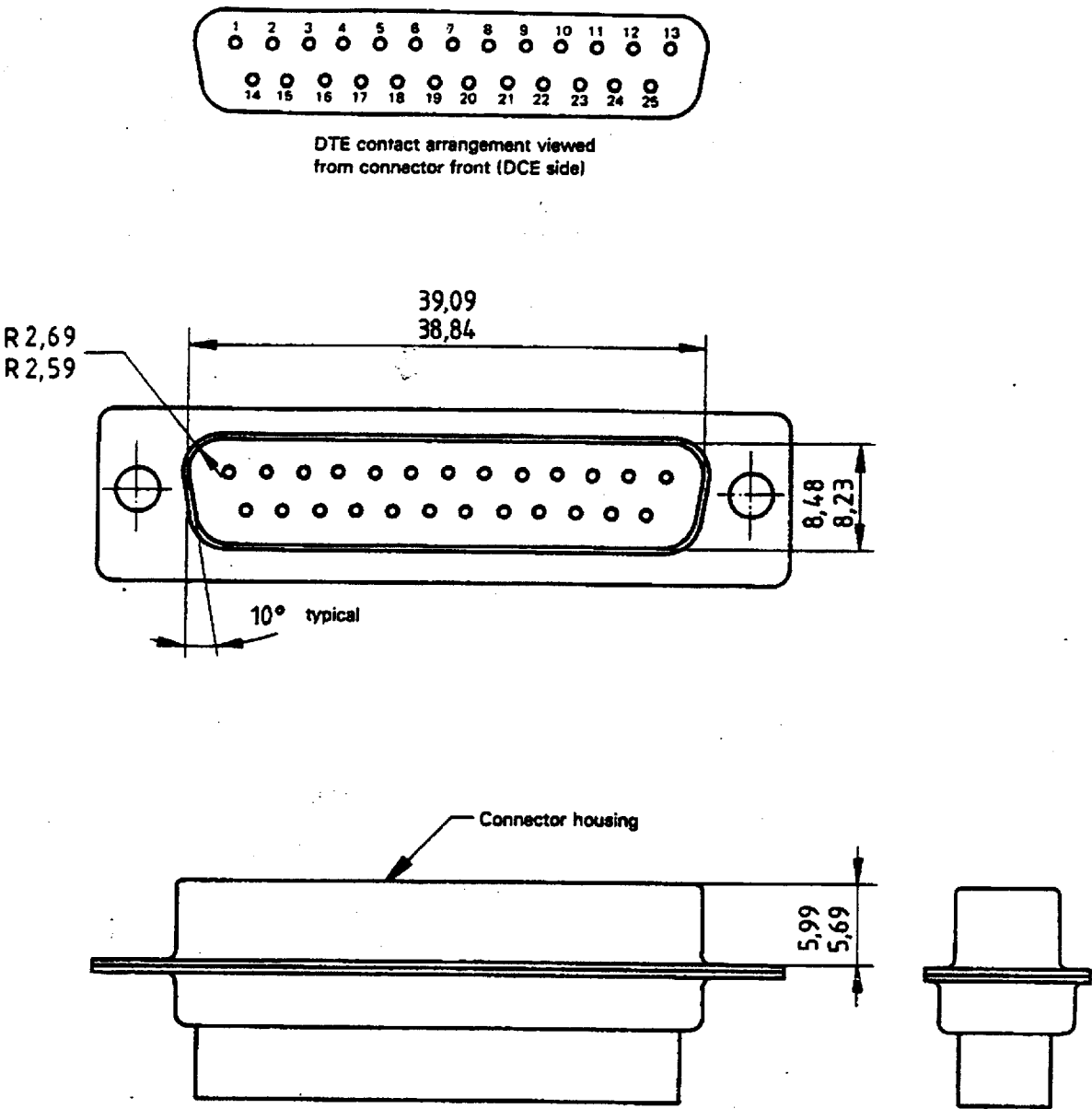


Figure 1 -- DTE connector

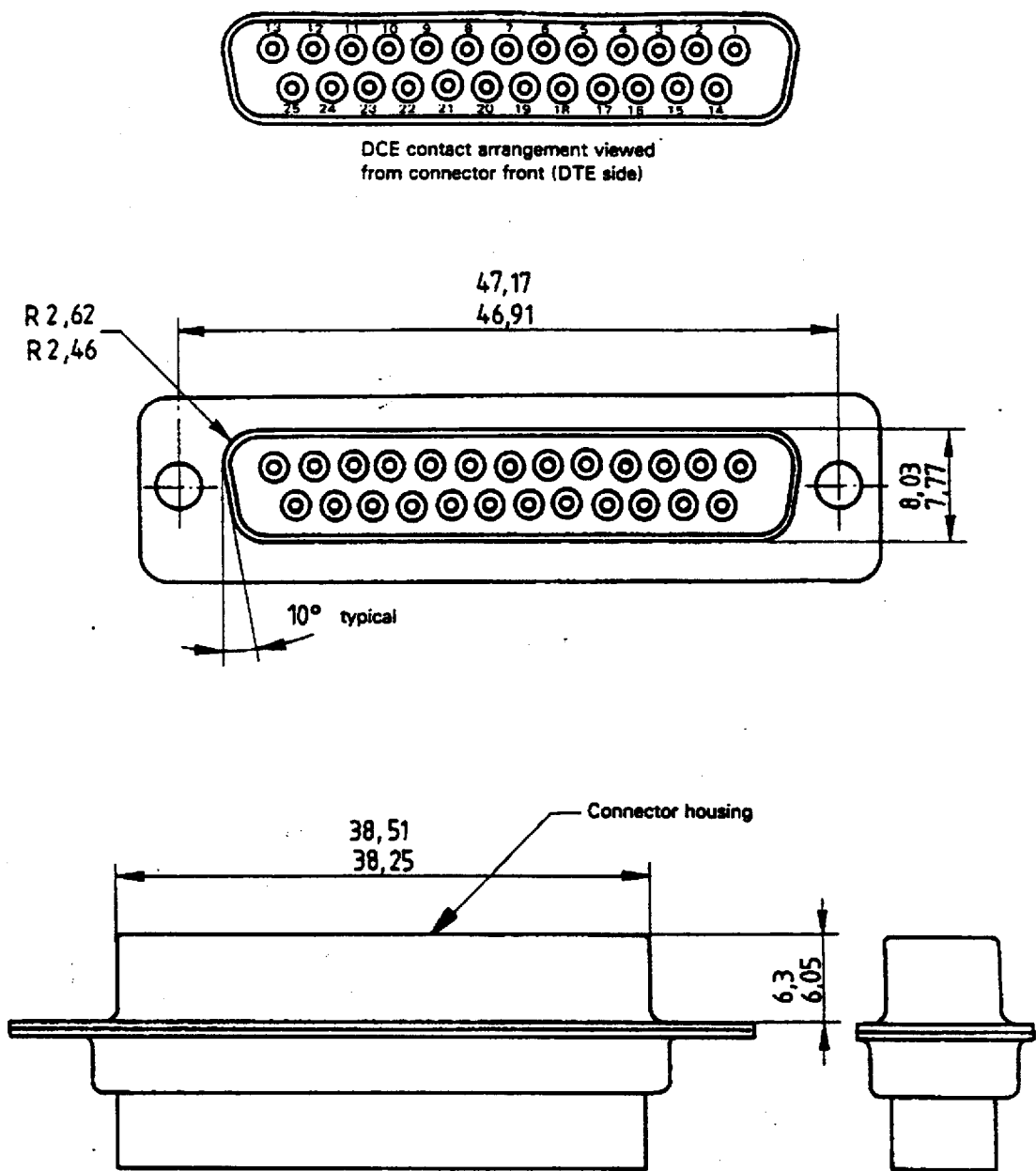


Figure 2 -- DCE connector

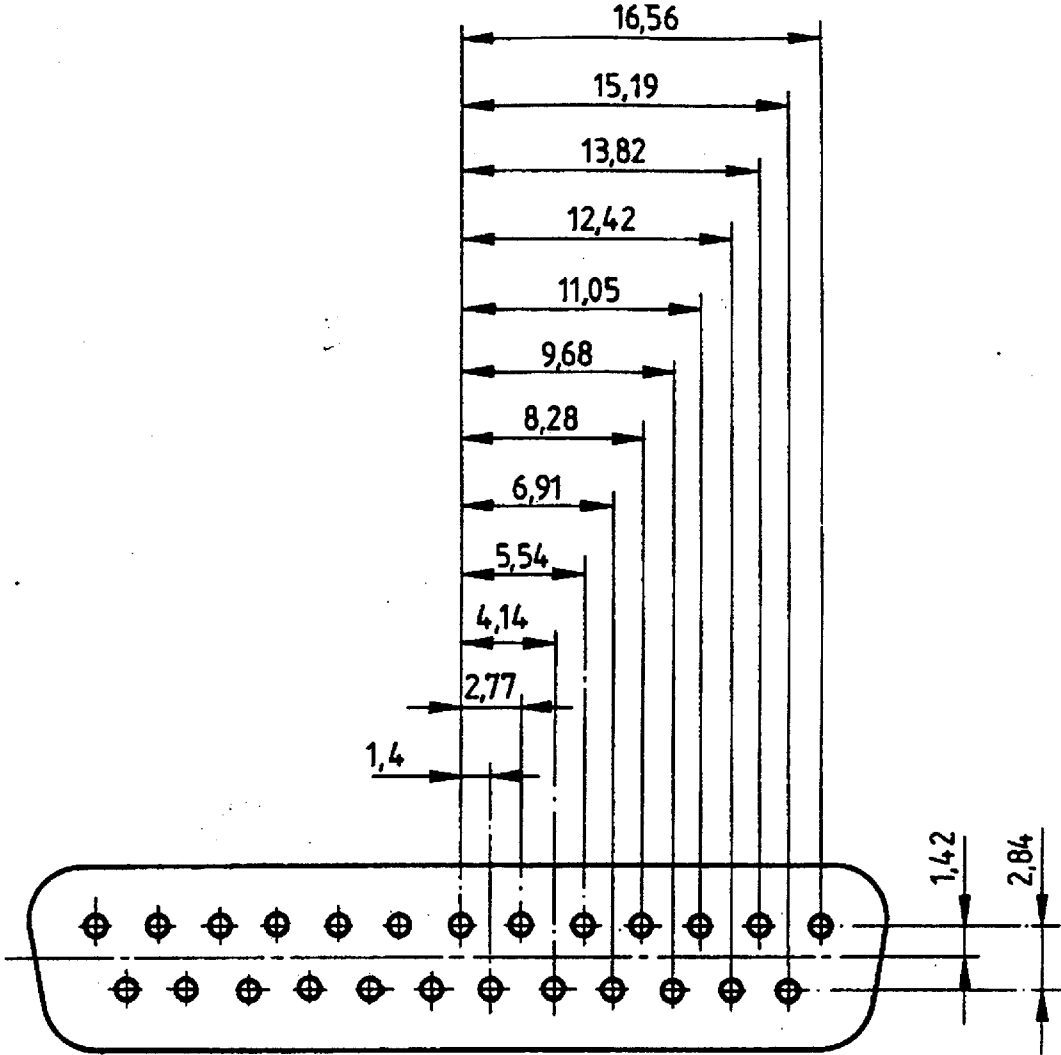


Figure 3 -- Connector dimensions

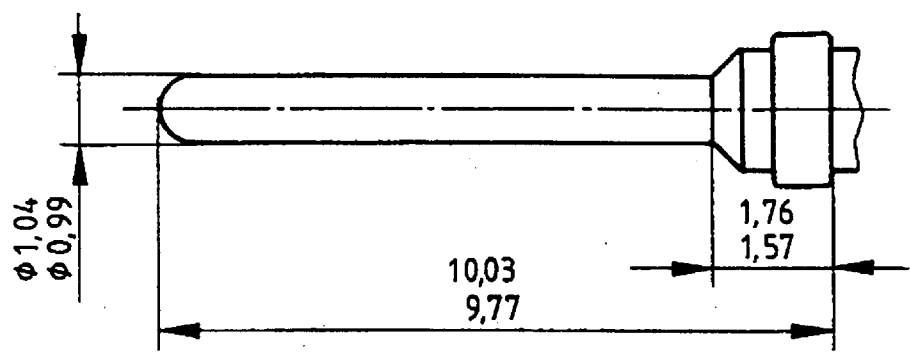


Figure 4 — Male contact

Dimensions in millimetres

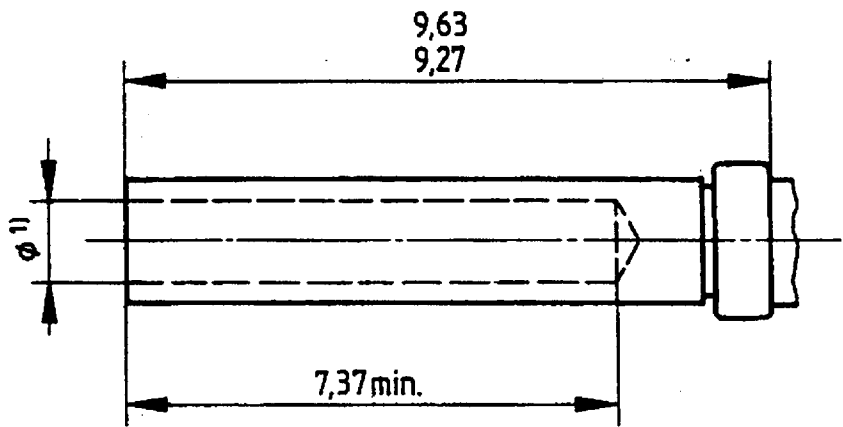
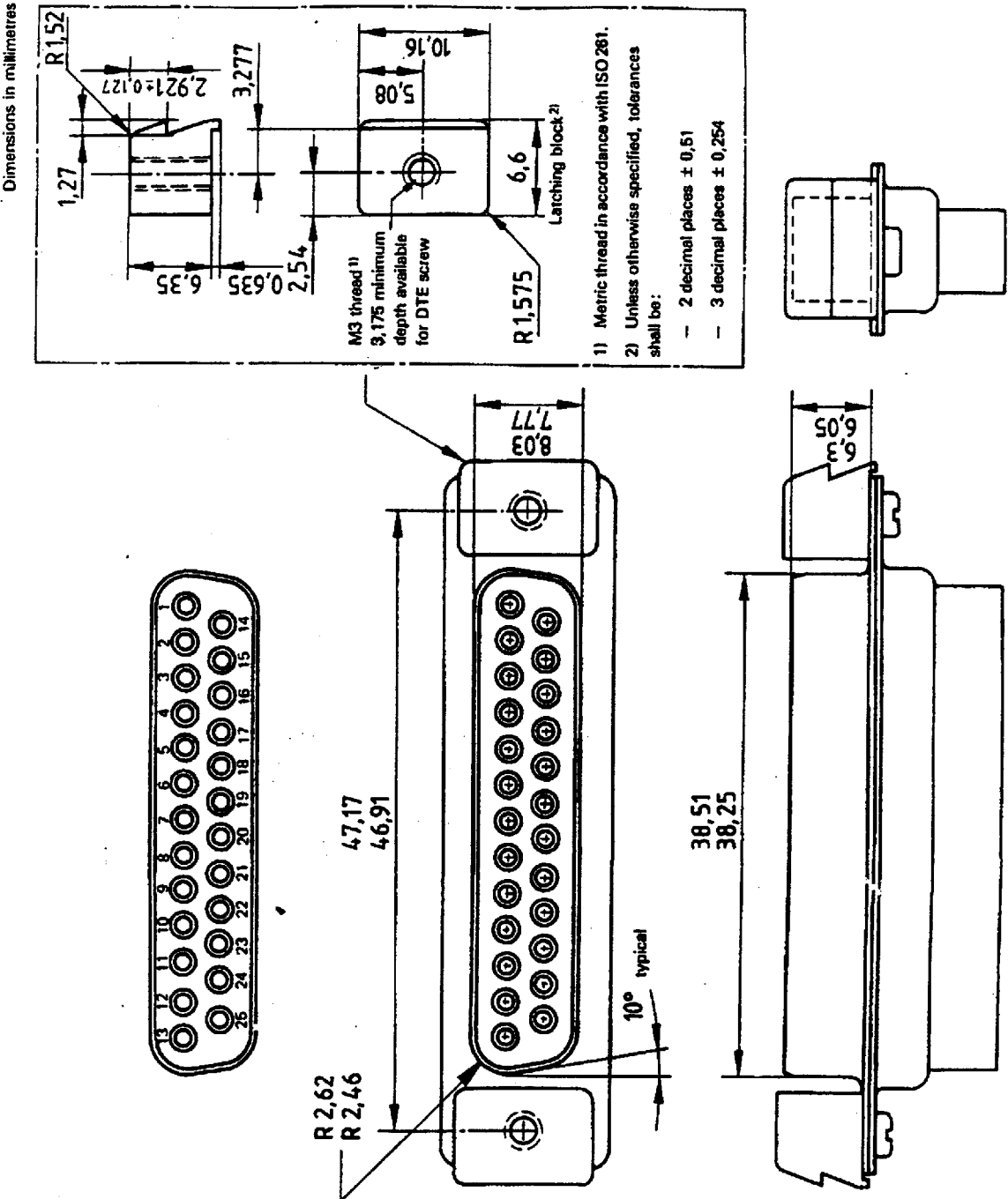


Figure 5 -- Female contact



The information provided in this figure is for designers who use the latching block or metric screws or both.

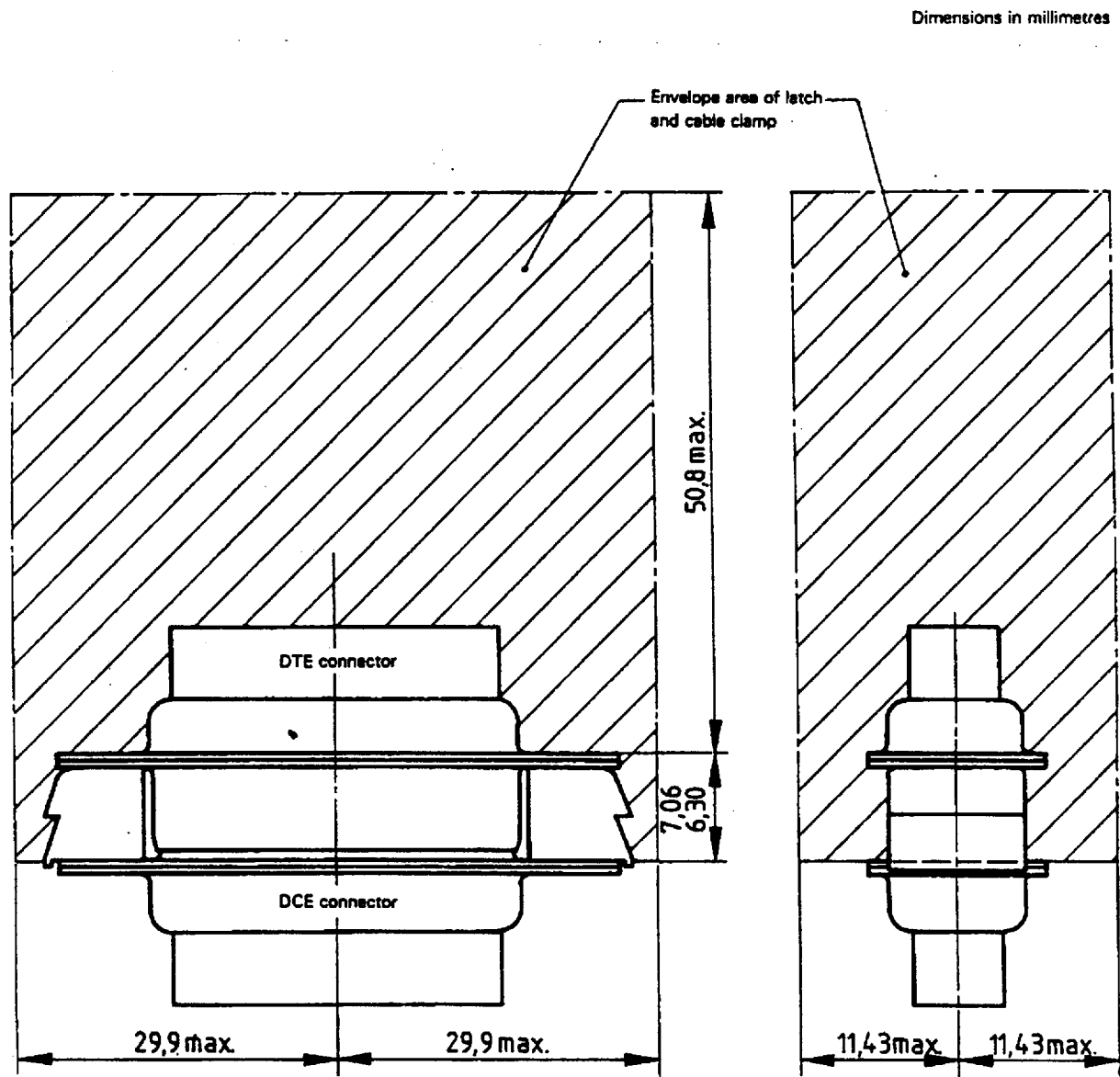
Figure 6 — DCE connector with latching blocks

Annex A
(informative)

Diagrams for finger clearance

This annex provides guidance on finger clearance for equipment designers.

Figure A.1 shows the minimum recommended spacing between multiple DCE connectors, taking into account the various locking devices (levers, screws) of DTE connectors.



Dimensions in millimetres

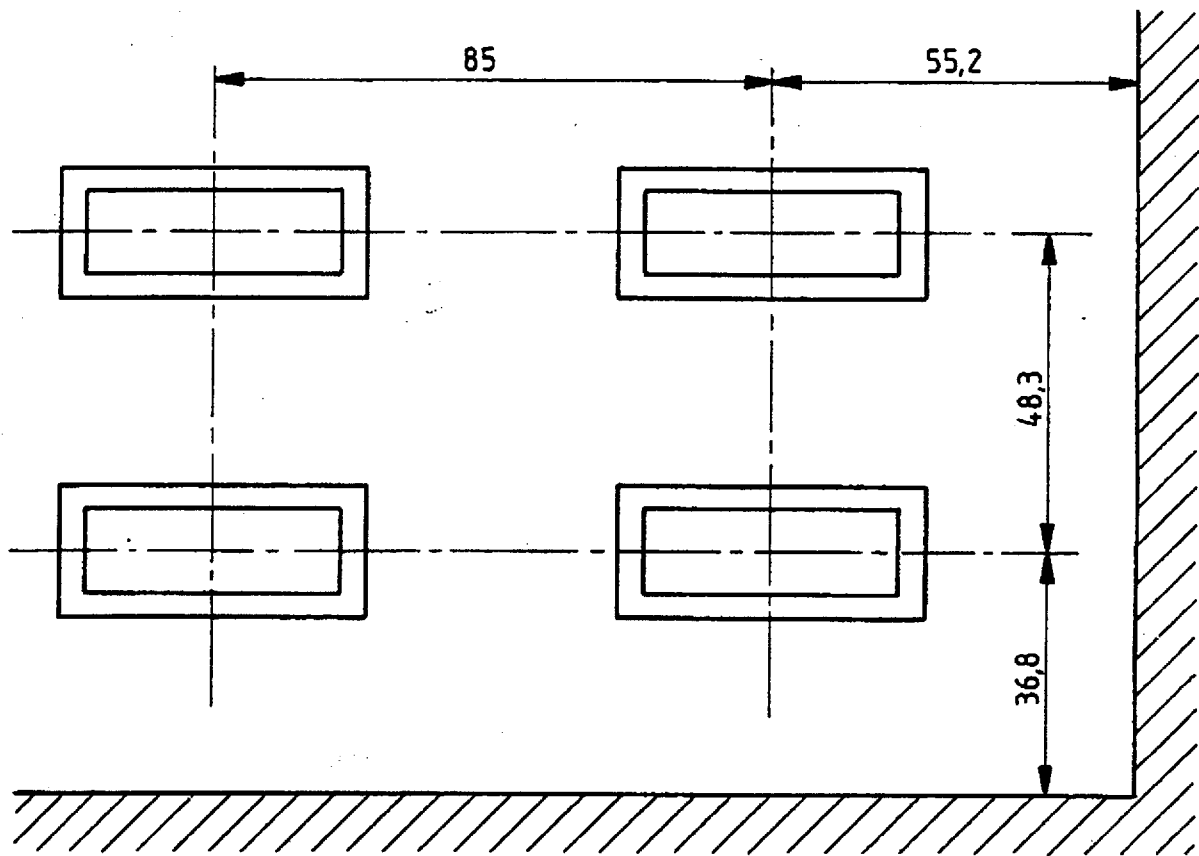


Figure A.1 - Finger clearance

Annex B

(informative)

Interoperation with adapters

B.1 ITU-T Recommendation V.36 and ITU-T Recommendation V.37

Interoperation is possible between equipment using this International Standard, table 1, column V.10, and existing equipment designed to support wideband modems as specified in ITU-T Recommendation V.36 and ITU-T Recommendation V.37.

Table B.1 illustrates the contact number assignments for ISO/IEC 4902 with a cross reference to the corresponding ITU-T Recommendation V.24 circuit assignments for the above column. It should be noted that circuits 107 and 108 have an „A“ and „B“ assignment (use ITU-T Recommendation V.11 electrical characteristics) in ISO/IEC 4902, whereas they have a single assignment (use ITU-T Recommendation V.10 electrical characteristics) in ISO/IEC 2110, column V.10. Therefore, they require the use of an active interconnect circuit, similar to that shown in figure B.1, on circuits where a V.11 driver is being used with a V.10 receiver.

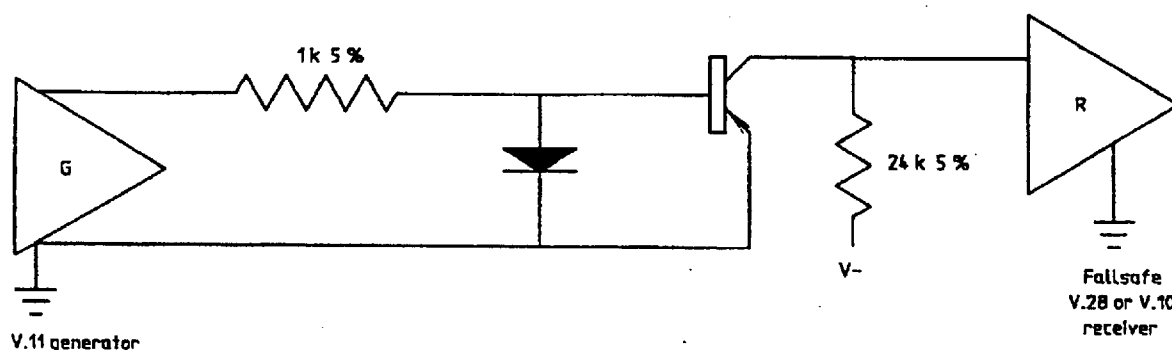


Figure B.1 -

B.2 ISO/IEC 2593

Interoperation between ISO/IEC 2110, column , and equipment using the ISO/IEC 2593 connector is possible. The use of an active circuit (similar to that shown in figure B.1) is recommended for the case where a V.11 driver is connected to a n ISO/IEC 2593 (V.28) receiver.

Table B.1 illustrates the contact number assignments for ISO/IEC 2593 and the corresponding contacts for ISO/IEC2110, column operation, specifying the type of interconnecting device to be used.

Table B.1 – Interconnection of ISO/IEC 2110, column V.10, with ISO/IEC 4902 and ISO/IEC 2593

	ISO/IEC 2110 column V.10	ISO/IEC 4902, ITU-T Recommen- dations V.36/V.37	ISO/IEC 2593
Circuit	Contact	Contact	Contact
	2)		
103-A	2	4	P
104-A	3	6	R
105-A	4	7	C ¹⁾
106-A	5	9	D ¹⁾
107	6	11, 29 ¹⁾	E
102-A	7	19	B
109-A	8	13	F ¹⁾
115-B	9	26	X
109-B	10	31	F ¹⁾
113-B	11	35	W
114-B	12	23	AA
106-B	13	27	D ¹⁾
103-B	14	22	S
114-A	15	5	Y
104-B	16	24	T
115-B	17	8	V
141	18	10	L
105-B	19	25	C ¹⁾
108	20	12, 30 ¹⁾	H
140	21	14	N
	22	15	

125			J
	23	20	
102-B			B
	24	17	
113-A			U
	25		
142		18	NN ¹⁾

1) May require active interconnect circuit.

2) See table 1, note 1.



EXPLANATORY REPORT	ISO/IEC DIS 2110
ISO/IEC JTC 1/SC 6 N 10415	
Will supersede: SC 6 N 9554	Secretariat: U.S.A. (ANSI)

This form should be sent to ITTF, together with the committee draft, by the secretariat of the joint technical committee or sub-committee concerned

The accompanying document is submitted for circulation to member body vote as a DIS, following consensus of the P-members of the committee obtained on:	
1995-12-14	
X	at the December 1995, Brazil meeting of ISO/IEC JTC 1/SC 6 (See Resolution Number 26 in document SC 6 N 10001)
	by postal ballot initiated on: 1996-
P-members in favour:	Australia, Brazil, Canada, Denmark, Germany, Japan, Republic of Korea, Sweden, UK, USA
P-members voting against:	--
P-members abstaining:	--
P-members who did not vote:	Belgium, Czech Republic, Finland, France, Italy, Norway, Russian Federation, Switzerland

Remarks:	
Per SC 6 Brazil Resolution 26, 6 N 10415 is forwarded to the ITTF for DIS ballot.	
The Disposition of Comments Report was circulated as SC 6 N 9970.	
Project: JTC 1.06.09.01.01	
I hereby confirm that this draft meets the requirements of part 3 of the IEC/ISO Directives	
Date: 1997-02-06	Name and signature of the secretary: Jean Shildneck

FORM 10 (ISO/IEC)